

# CLIMATE & STRATEGY P A R T N E R S



## **Innovative Finance Mechanisms for Energy Efficient in Buildings: *Finance Models from Europe, USA and Spain Compared***

Presentation Prepared for and Hosted by :

economics<sub>for</sub>  
energy



Peter Sweatman, Chief Executive

# Specialist Consulting Firm in Low Carbon Strategy and Energy Efficiency Finance

Peter Sweatman, CEO



- Engineer from Cambridge University
- 9 years at JPMorgan
- 5 years as Social Entrepreneur
- 5 years as MD for Iberia for Climate Change Capital
- Founder and CEO of Climate Strategy & Partners
- Clients include:



## Company

Climate Strategy is a firm dedicated to addressing the opportunities and risks created by climate change. It currently acts in three areas:

1. **Climate Strategy Consulting:** We work to deliver information, insights, analysis and strategy consulting services to clients whose future is increasingly impacted by Climate Change, Environmental and Sustainability policies and best practice.
2. **Proactive Partnerships:** Climate Strategy looks to accelerate the cross-border flows of resources, ideas and expertise in Clean Energy and Clean Technology through working with world class partners and leading climate solution providers in Iberia.
3. **Energy Efficiency Policy and Project Execution:** Climate Strategy has made energy efficiency a core competence across the firm as we are convinced that it is the single most interesting source of value and emission reductions in industry and in the built environment in the short term. Climate Strategy is currently working to support policy development and project execution in this area.

Climate Strategy looks to differentiate itself through its :

- **Sector Experience:** Our teams and partners bring a track record of excellence in relevant spheres.
- **Open Architecture:** Our business model embraces active partnerships with global solution providers and innovative market leaders.
- **Vibrant Networks:** Climate Strategy and its team members are regular contributors to energy, clean tech and climate fora on and offline.
- **Collaborative ICT Platform:** Climate Strategy's integrated approach to IT is designed to give greater resourcing flexibility and enhanced client service.
- **First Class Execution**

Climate Strategy is headquartered in Madrid, Spain

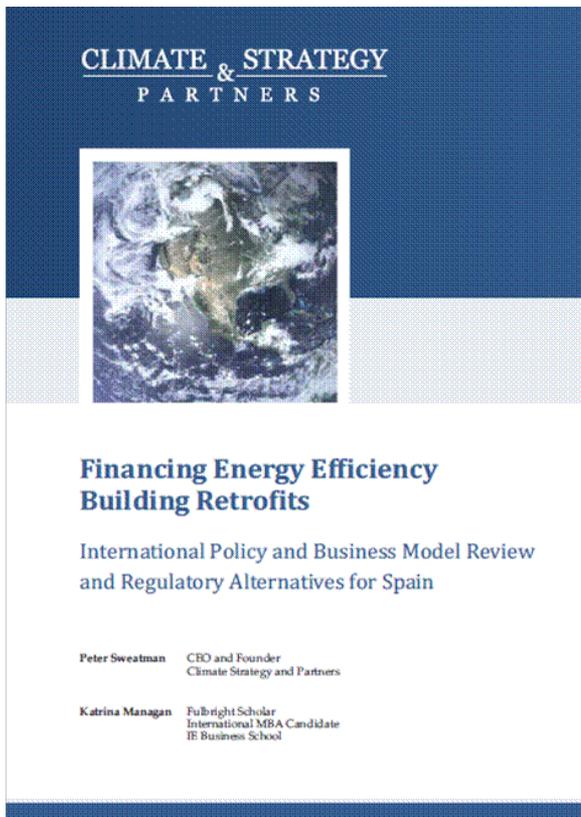
*Climate Strategy is an unregulated consulting firm offering strategy and business consultancy in areas related to Clean Energy, Clean Technology, Energy Efficiency, Sustainability and Climate Change and related Policy work. Climate Strategy is not a financial advisor and it does not provide nor promote financial investment, fundraising nor financial advisory services.*



climate changes everything

# Published Landmark Study on “Financing Energy Efficiency Building Retrofits” in October 2010

The following are notable stages in the study’s research and interview process



## ■ Extensive literary Review

- Built a database of around 120 relevant white papers, articles and pieces of legislation

## ■ Business Model and Financing Focus

- Policies analysed from the perspectives of stakeholders and impacts on business models

## ■ New Business Model Development

- By combining the best features of existing business models and policies we create the hybrid business model:
  - Aggregated Investments Model

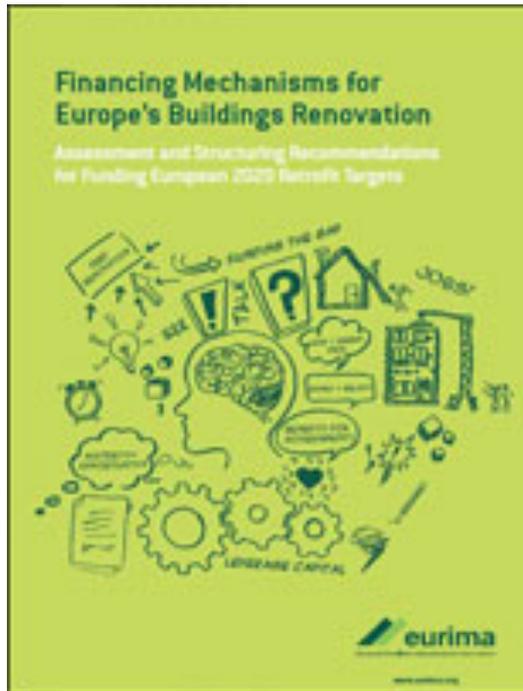
## ■ 35 International Expert Reviewers

- Split equally across USA, UK and Spain
- Selected from areas of finance, policy, academia, energy and ESCO/retrofit
- 2 rounds of comments included in the final text

## ■ Assumptions, exclusions and scope limitations

# Authored for Eurima “Financing Mechanisms for Europe’s Buildings Renovation” launched Jan 2012

The following are notable stages in the study’s research and publication process



## ■ Compiled in 2011 as “Finance” became key driver in Energy Efficiency dialogue

- Practical meta-summary of existing work on Energy Efficiency Finance and EU context

## ■ Strategic Focus on the “Finance Gap”

- Assessment of the Financing Needs for EU Members States intent on meeting 20-20-20 targets and scale them to size of each economy

## ■ Identify Financing Sources

- Instead of focusing on “instruments” (of finance) the paper looks at the six financing sources and seeks to understand and align their motivations and identify instrument design typologies which will have maximum impact

## ■ Video and MEP Supporting Materials

- Supporting video and powerpoint produced
- Sort-launched to MEPs in Strasbourg 2012
- Key conclusions presented in EU Parl, EU Commission and to ITRE



# INFORME GTR 2012

UNA VISIÓN-PAÍS PARA EL  
SECTOR  
DE LA EDIFICACIÓN EN ESPAÑA  
PLAN DE ACCIÓN PARA UN  
NUEVO SECTOR DE LA VIVIENDA

Patrocinado por:  European  
Climate Foundation

Coordinado por:

**CLIMATE & STRATEGY**  
PARTNERS

 **GBCe**  
green building council *españa*

**FUNDACIÓN  
CONAMA**

  
FUNDACIÓN  
la casa  
que ahorra

  
**URSA**  
uralita

# Agenda

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- 1 Financing Needs for European Buildings**
- 2 Case Studies from Europe, USA and Spain
- 3 Conclusion

# Europe needs to invest Euro 60-100 billion per annum in Buildings Energy Refurbishment from 2012-2020



Image Source: smallbiztrends.com

*“While there are many regulatory proposals aimed at filling the policy gap identified by the Energy Efficiency Plan 2011, there have been fewer attempts made to quantify and resolve the commensurate and considerable financing gap.”*

## ■ Solving Regulatory and Market Failures: Methodology

- An accurate view of the size of the financing needs for European buildings
- A clear pathway towards securing them in the timeframe required
- An adequate mix of public and private finance

## ■ “Three Methodologies” + Their Investment Figures

- **Bottom-up Approach (EuroACE):  $f_n$  (# Retrofits x Value)**
  - Annual European investment capital budget range of Euro 50 billion to Euro 180 billion
- **Top-down Using the IEA’s 2050 GHG targets**
  - Annual investment figure for buildings in the EU27 countries of Euro 110 billion each year until 2050
- **Procurement and Development Cost Approach (Barclays/ Accenture)**
  - Total cost of Low Carbon Technologies by 2020 of Euro 2.9 trillion, from which Buildings require a total 2011-2020 procurement and development cost of Euro 600 billion (approximately Euro 67 per annum).

# At a country level, the EU Investment Target is consistent with 0.5-0.8% GDP Investment Annually



Image source: <http://ec.europa.eu>

*“Our **methodologies** allow us to determine an order of magnitude investment capital figure for European buildings which, through the use of existing successful national financing models, allows us to develop a European financing framework which can scale to deliver levels of national retrofit activity required to meet **Europe’s 2020 energy efficiency targets.**”*

## ■ Appropriate “Order of Magnitude”

- Investment required in European buildings between now and 2020 is Euro 100 billion per annum.
- In the context of the EU 27 2010 gross GDP, the figure is 12 trillion
  - This implies an approximate annual investment into energy efficiency in buildings on average per country of just over 0.8% of gross GDP to deliver Euro 100-150 billion in annual savings by 2020.

## ■ Cross-Check of Comparable Research

- The figures above are consistent with **Mckinsey’s** work on the capture of NPV - positive savings in the USA:
  - At a minimum, the US should be investing approximately \$67-79 billion (c. 0.5% of US GDP) per annum in building energy efficiency measures
- And coincides with **UNEP’s** 2010 research which calls for annual investment of \$308 billion in green buildings globally (0.5% of 2010’s global GDP) until 2050

# Agenda

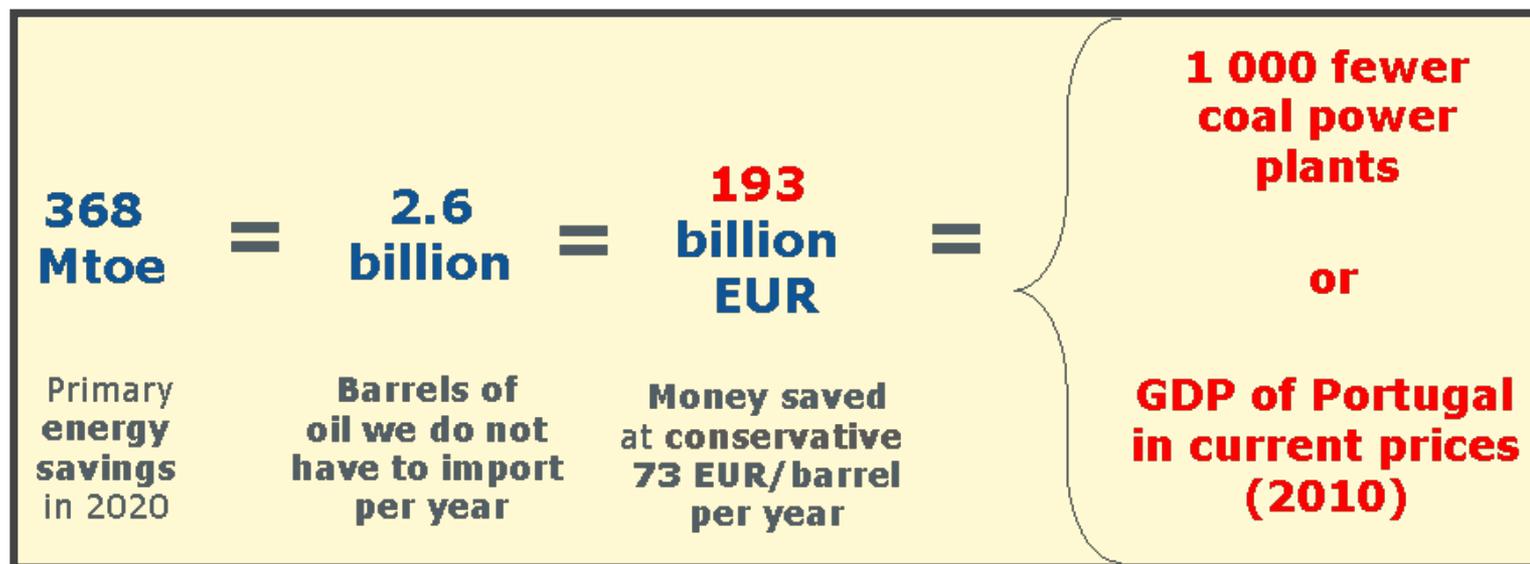
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1 Financing Needs for European Buildings

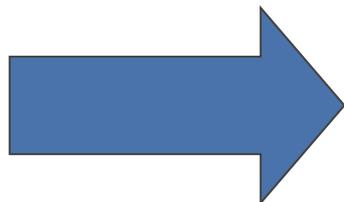
**2 Case Studies from Europe, USA and Spain**

3 Conclusion

## The Benefits of Energy Productivity Gains and Savings (Energy Efficiency) for the EU are SIGNIFICANT



...AND IF NOT



- Imports of 1,4 billion barrels of oil result in € 107 billion being 'exported'
- Construction of 550 coal power plants and accompanying infrastructure
- EU GDP will lose the net positive impact of energy efficiency of at least € 34 billion

# Buildings Investment Capital comes from Six Sources and in Eight Instrument Categories



Image Source: kleanindustries.com

***“In 2010, EuroACE identified in excess of 100 financial or fiscal instruments which were in place across Europe which represented a total investment in the order of tens of billions of Euros***

***One of the most important roles of Government Policy is to lever private capital to invest alongside its own orders of magnitude which reach 0.5-0.8% GDP every year from now until 2020”***

## ■ Sources of Capital

- Government, Building Owner, Building Occupier, Bank, Renovation Contractor and Energy Supplier
- Availability of Capital depends on:
  - The source’s access to and cost of funds
  - Perception of the risk / return characteristics of the renovation investment
  - Other competing investment priorities

## ■ Instrument Categories

- Preferential Loans, Subsidies, Grants, Third Party financing, Trading (White/Energy Certificates), Tax Rebates, Tax Deductions and VAT Reductions

## ■ Key Role of Government

- Government - through appropriate policies can significantly impact each of the private sector funding source’s investment priorities perception of the risk / return characteristics of the investment and potentially also access to and cost of funds

# Germany: Catalysing the on lending by Banks to Refurbish Client Buildings...

## ■ Germany and the KfW

- Germany has achieved impressive co-financing ratios of public to total funding for energy efficiency retrofits which started at 1:4 until 2006, and subsequently increased to 1:9 through the introduction of new programs coordinated by state bank KfW.
- KfW – with Euro 6 billion of federal funds was able to deploy Euro 27 billion efficiency investment through program activity stimulating a total and private investment flow totalling Euro 54 billion, thus creating a “waterfall effect”.
- Germany currently refurbishes around 200,000 buildings a year (equating to c. 400,000 homes) and to date has retrofitted 9 million units to high energy for heating efficiency standards.
- With an observed average Euro 36,000 investment per home, this implies a total annual investment of Euro 36 billion (or 1.4% of German GDP).

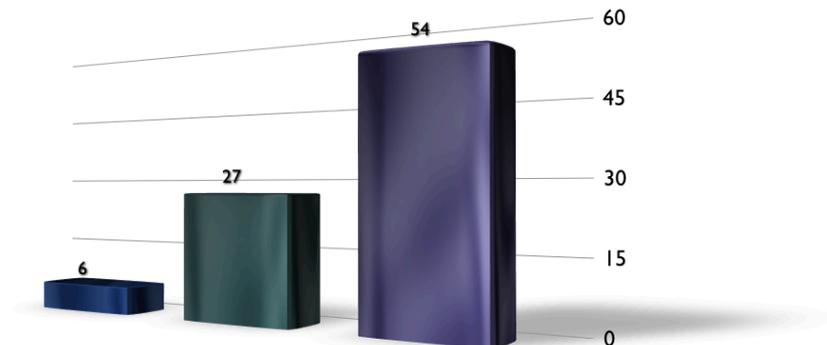


Image source: 123rf.com

*“This **“waterfall effect”** was created through several positive design features of KfW’s programmes including their deployment through the networks of private banks ensuring broad reach, leveraging banks’ retail transaction processing capacities and their subsidized 2.75% interest rates.”*

## KfW Commissioned Julich Centre to model Macroeconomic savings from programme...

**SALES TAX**

**INCOME TAX**

**AVOIDED s/s**

	2008	2009	2010
Programme costs	1,293	2,035	1,366
Sales tax levied on investor	1,173 [2,314]	2,313 [3,536]	2,343 [4,091]
Taxes on products levied on businesses, less subsidies	94 [185]	185 [283]	188 [328]
Other production duties levied on businesses, less any other subsidies	76 [150]	149 [228]	151 [264]
Income tax and insurance contributions, incl. solidarity surcharge	1,167 [2,302]	2,273 [3,475]	2,282 [3,984]
Taxation of corporate profits and income from assets, incl. solidarity surcharge	261 [515]	441 [674]	388 [677]
<b>Overtime scenario (OS)</b>	<b>1,478</b> <b>[4,173]</b>	<b>3,326</b> <b>[6,161]</b>	<b>3,987</b> <b>[7,978]</b>
Avoided expenditure on unemployment	857 [1,764]	1,800 [2,752]	1,823 [3,186]
<b>Jobs scenario (JS)</b>	<b>2,335</b> <b>[5,937]</b>	<b>5,126</b> <b>[8,913]</b>	<b>5,810</b> <b>[11,164]</b>
[ ]: promoted investments			
Source: own calculations		IEK-STE 2011	

# Case Study: UK's Green Deal and GIB

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Image source: rggi.org

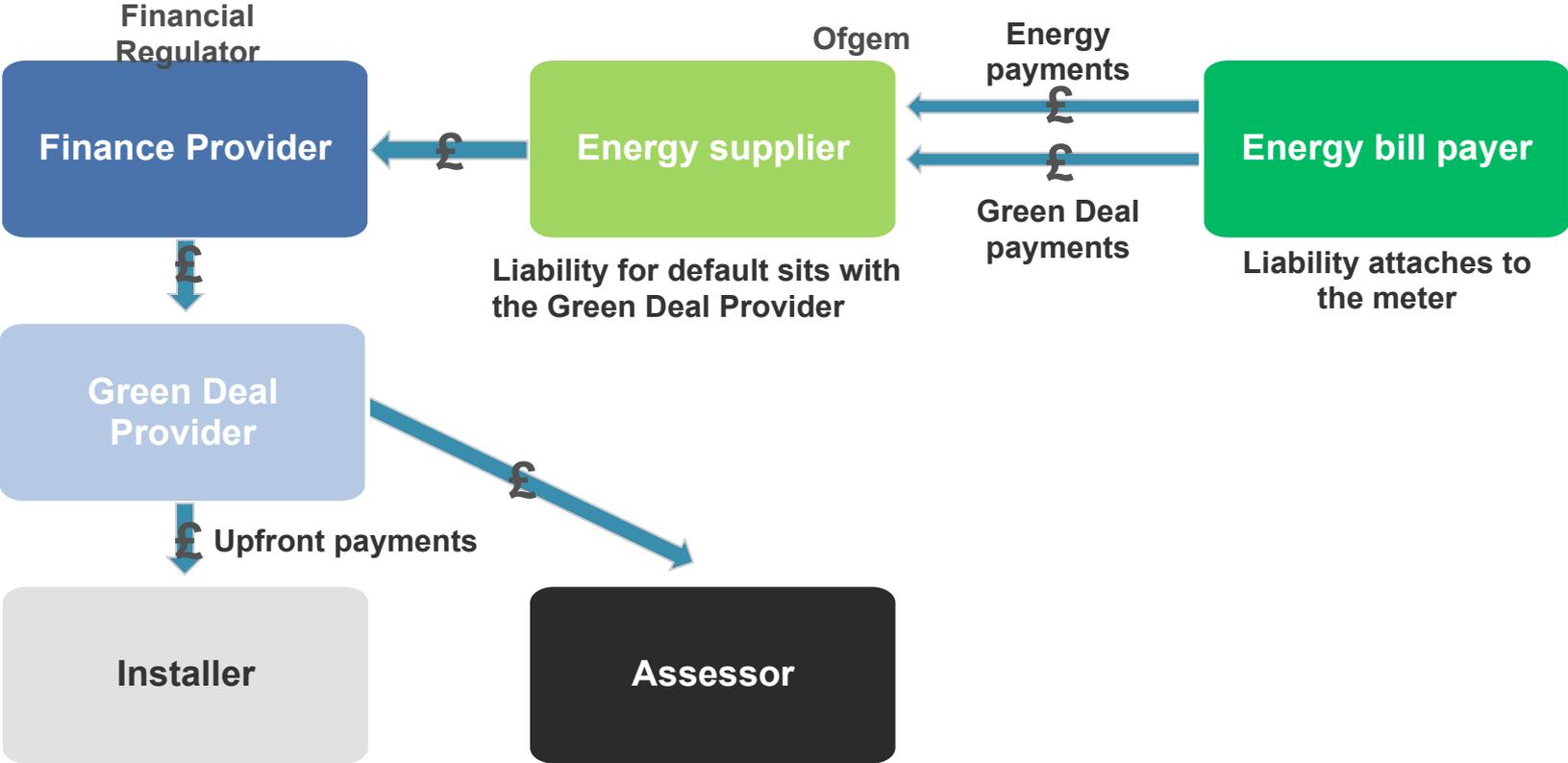
*“The UK’s Green Investment Bank (GIB) anticipates and initial capital allocation of 3 billion from the UK Government which it anticipates to catalyse a further 15 billion of **green Infrastructure investment** over four years (an initial 1:5 leverage ratio).”*

## ■ The UK’s Green Deal and Green Investment Bank

- Starting in 2013 it anticipates the retrofit of over a million homes per annum. The Green Deal looks to provide a maximum of £10,000 investment capital per intervention and is expected to deliver aggregate investment in the region of £7bn- £11bn per year (0.5-0.7% of UK GDP) over 15 years.
- The UK government has committed to upgrade the efficiency of up to 14 million homes by 2020.
- To date the UK has provided direct subsidies of up to £3,500 to 2 million low income households under its Warm Front programme and starting in 2008, it introduced a white certificate program (CERT) requiring domestic energy suppliers to make CO2 savings investments in their costumers’ properties which has generated a further £5.5 billion of retrofit investment.

# UK Innovation: “On Bill” Repayments for Energy Efficient Refurbishment subject to “Golden Rule”

## Proposed cash flows



# How a Green Investment Bank could stimulate private finance into UK Household Energy Refurbishment

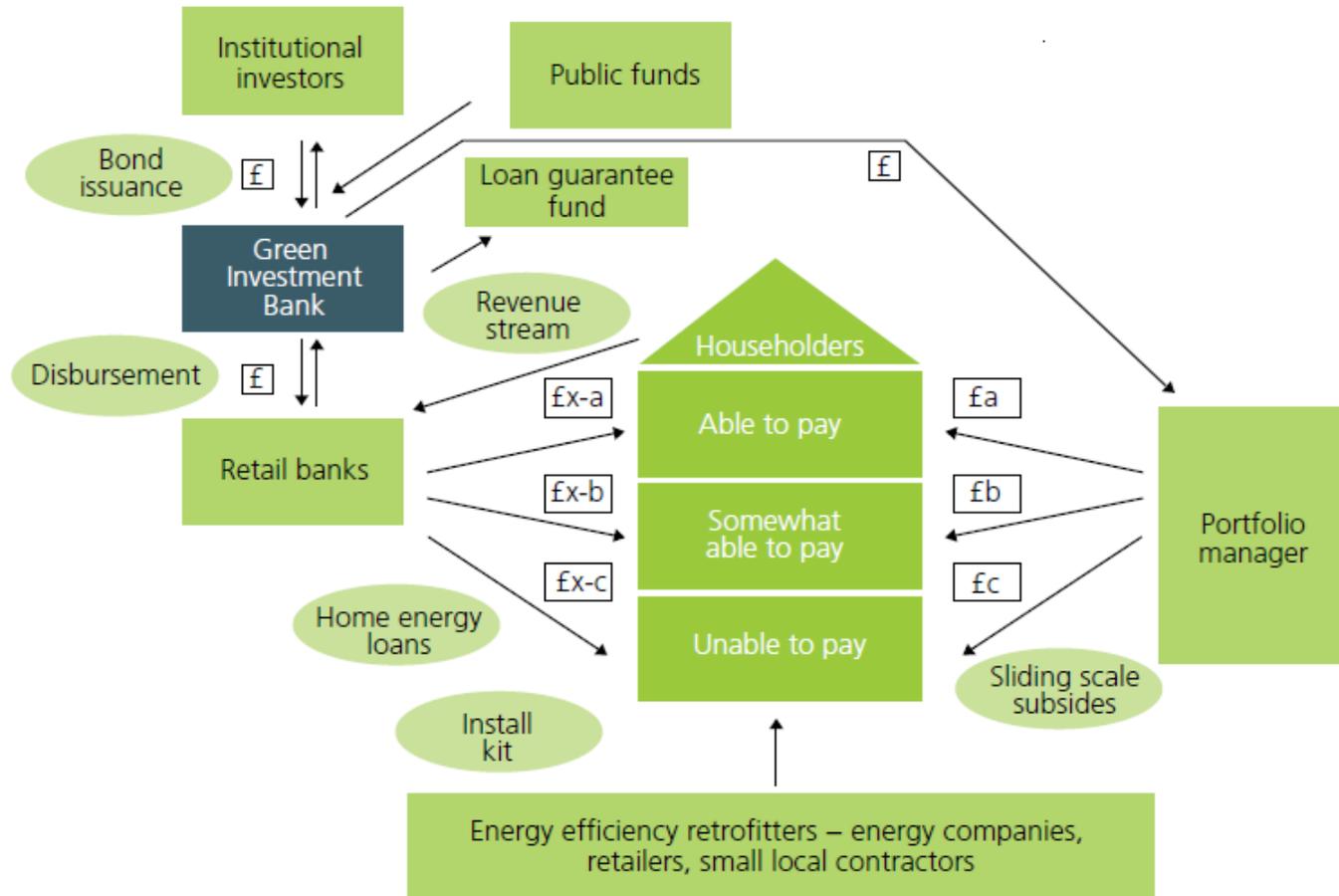


Image source: Green Investment Bank Commission Report

# USA : PACE Provides Finance to Commercial Buildings Owners that can be repaid through Property Tax

## PACE stands for Property Assessed Clean Energy

Key partners include:



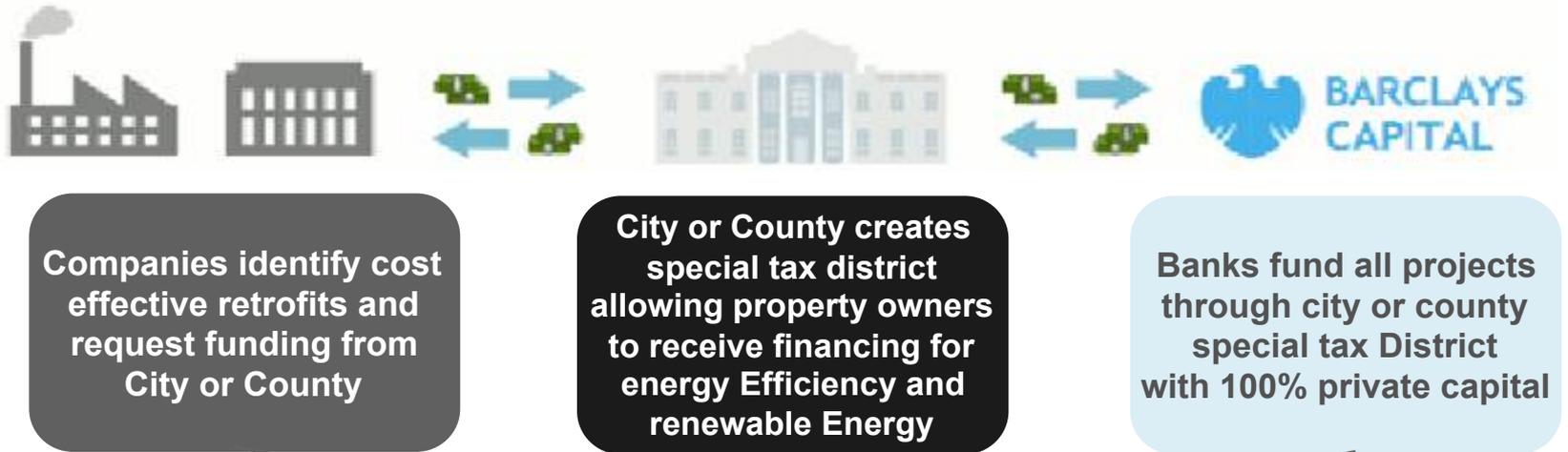
Bryant  
Miller  
Olive



- Money is provided to owners of improved property for improvements regarding:
  - Energy Efficiency
  - Renewable Energy
  - Water Conservation
  - Wind resistance
- Repayment:
  - Secured by a tax lien on the property
  - Amortized over the life of the improvements
  - Funds to make the tax payments come from the reduces utility bills that result from making the improvements
- Assessments:
  - Are not approved unless the energy costs savings are greater than the cost of the improvements

*\* Source: The United States Business Council for Sustainable Development*

# US PACE Programme: How Does PACE Work? What are its Benefits?



## Projected Benefits

- Job Creation: 5 million jobs nationally
- Economic Stimulus: \$500 billion through the construction trades, with strong local multiplier
- Infrastructure Development: Large scale upgrade to the nation's power grid -privately financed
- GHG Reduction: large carbon footprint reduction done profitably

\* Source: The United States Business Council for Sustainable Development

# The Reasons why PACE is Attractive...

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Pace surpasses conventional company financing for several of reasons

- 1 **Does not require company cash / company debt capacity**
- 2 **No capital competition for Return on Investment regarding capital projects / company operations**
- 3 **No Split Incentives Problem: Energy Investment costs transferred to tenant as property tax increases**
- 4 **No short -term Money Trap: PACE long term financing with long-term assets**
- 5 **Fossil Fuel Price Volatility: Reduces vulnerability to fluctuating fuel costs**
- 6 **Pace is collateral based, not credit**

# GRUPO DE TRABAJO SOBRE REHABILITACIÓN GTR

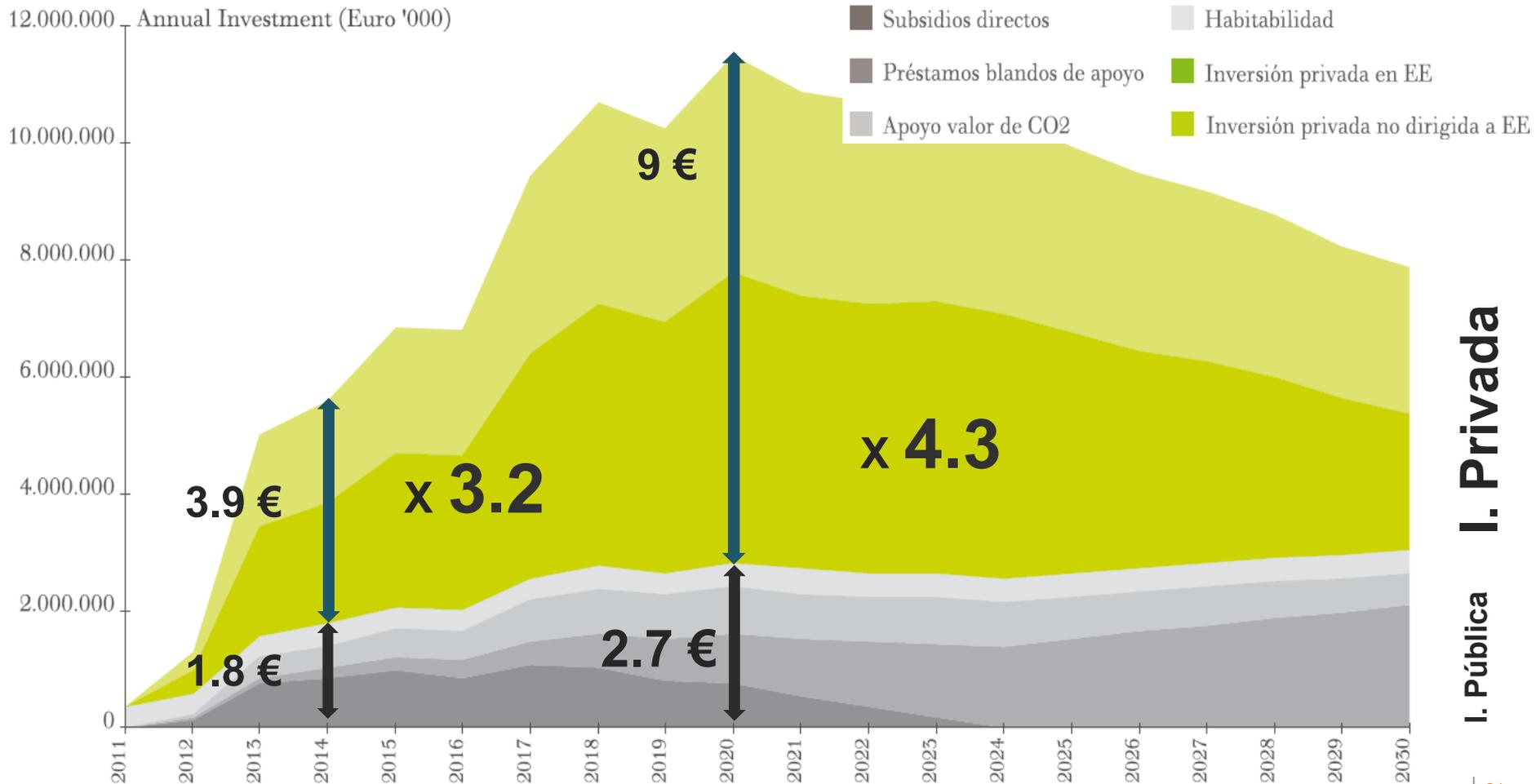
Coordinado por:



## La Nueva Política Europea de Eficiencia Energética



## Magnitud de la inversión. Modelo público privado



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# All Potential Sources of Value MUST be contemplated in the Financing and Policy Solutions



Image source: bestgreenhometips.com

## ■ Value Framework and Economic Incentive

- In the context of a building retrofit, there are three key sources of value:

Energy savings

Implied emissions reductions

Other material improvements (sometimes referred to as “co-benefits”)



Image source: guardian.co.uk

***“Refurbishment activity can be driven by any one, or a combination, of these three value sources: Energy savings (classic ESCO activity), implied emissions reductions (white certificate programs like the UK’s CRC Energy Efficiency Scheme) or the other material improvements (eg. Commercial property refurbishments which include improved energy performance alongside a more sizeable general renovation).”***

# Policies and Finance go “hand in hand” and 10x leverage can only be achieved with Strong Alignment



Image source: mustknowinvesting.com

*“From a structuring perspective, we believe that, independently of originating channel (Bank, ESCO, Energy supplier), the broad primary source of capital (debt capital markets) required for such significant sums are those which can guarantee the most permanent access to such low cost funding”*

## ■ Successful Polices

- If successful policies and programmes are implemented, the total amount of energy efficiency activity funded in Europe by 2020-25 could reach Euro 1 trillion.
- If levered 1:10, this implies Euro 100 billion of public funding together with Euro 900 billion of private sector co-funding.
  - Equivalent to 15% of the total EU27 residential mortgage market in 2008.
  - Of similar magnitude to the expected energy infrastructure investments required of European Utilities.
- The role of Government “policy bank” balance sheets is key (eg. KfW) together with local retail banks working alongside the policy banks making low cost customer retrofit loans a priority and sharing the risk.



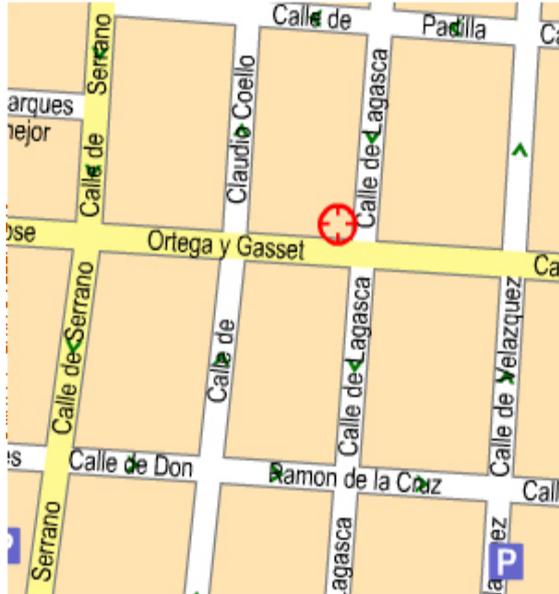
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2-3x ?

# Contact Climate Strategy & Partners



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